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EXAMINER
PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
3641	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/978,174	Applicant(s) NAKAMARU ET AL.
	Examiner Rick Palabrica	Art Unit 3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *9 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's election without traverse of Group I, species A, D and F in Paper No. 6 is acknowledged. The examiner agrees with the applicant that claims 1-8 and 10-13 are readable on the elected species, with claim 1 being generic.

Drawings

2. The drawings are objected to because Fig. 2 shows the drywell (231) being physically isolated from the pressure suppression pool (404), contrary to the specification on page 22 and claim 1 that both of these structures are contained within the pressure containment vessel (401). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e., failing to provide an enabling disclosure.

The claimed invention is a boiling water reactor with natural circulation.

However, there is no adequate or enabling disclosure of how such could be accomplished using the applicant's invention.

On page 21, 2nd full paragraph, the applicant states that his embodiment "creates a chimney effect, whereby a stronger natural circulating force" can be obtained by his embodiment. There is neither an adequate description nor enabling disclosure as to how and in what manner said embodiment so create the claimed chimney effect and obtain stronger natural circulating force. The disclosure is insufficient as to what exactly is meant by the relative term, "stronger", e.g., stronger than what and how strong is strong, etc.?

On page 23, 1st full paragraph, the applicant states that his control drive mechanism 22 is designed to have "maintenance-free specifications." There is neither an adequate description nor enabling disclosure as to how and in what manner the control rod drive mechanism is so designed to be "maintenance-free" under the harsh temperature, pressure, radiation and corrosion conditions within the reactor pressure

vessel. Note in particular that this mechanism is not a passive element but consists of moving parts.

On page 23, 1st full paragraph, the applicant states that his fuel assemblies 206 require no fuel replacement over 20 or more years. There is neither an adequate description nor enabling disclosure as to how and in what manner such long-term, no fuel replacement operation is achieved. For example, what design features are there to ensure that there will be no fuel leakers during the 20 year or so operation, what features are built into the reactor core to compensate for negative reactivity due to accumulation within the fuel rods of fission products that act as poisons, etc.

On page 23, last full paragraph, the applicant discloses two isolation valves being provided as far as possible to the outer side of the pressure containment vessel. The disclosure is insufficient as to where exactly these valves are located.

On page 24, 1st full paragraph, the applicant discloses that his invention, which integrates buildings having different seismic grades, makes it possible to "mitigate seismic design conditions." There is neither an adequate description nor enabling disclosure as to how and in what manner said "mitigation" is so achieved when the "integrated building" would have to be designed to highest seismic grade building, such as the reactor building, when it is integrated with other the lower seismic grade buildings (e.g., turbine building). Also, the disclosure is insufficient as to what exactly is meant by the term, "mitigate seismic conditions."

On page 24, 1st full paragraph, the applicant discloses that the pressure suppression pool 404 is "disposed above the reactor core." There is neither an

adequate description nor enabling disclosure as to how and in what manner the pool is so disposed above the core when Fig. 2 shows part of the suppression pool is at a lower elevation than the top of the reactor core 202.

On page 25, 1st paragraph, the applicant discloses that during a loss-of coolant-accident, gravity driven core-cooling pipe 234 injects water from the suppression pool to the reactor vessel, via a check valve and a shut-off valve, flooding the core and preventing a severe accident. There is neither an adequate description nor enabling disclosure as to how and in what manner said severe accident is so prevented. Specifically, the disclosure is insufficient as to: a) where exactly are these two valves located; b) when exactly would the valves be activated (e.g., time after the event or pressure differential across the valve); c) which one of these valves be activated during the accident; d) how exactly would back pressure from the steam-water mixture be prevented from causing failure of the required valve(s) to open; d) what exactly must be the volume of water in the pressure suppression pool to ensure that the core would be sufficiently cooled to prevent severe core damage, etc.

On page 25, 3rd paragraph, the applicant discloses that the present embodiment meets the permission requirements of the authorities of severe accident countermeasures. The disclosure is insufficient as to who exactly are these "authorities."

On page 26, 1st paragraph, the applicant discloses that the small volume of the drywell permits injection of water readily, such that "retention of the molten core material inside the reactor pressure vessel can be easily attained, thereby preventing the event

from progressing." There is neither an adequate description nor enabling disclosure as to how and in what manner said molten core can be so retained easily within the reactor vessel. Specifically, the disclosure is insufficient as to: a) what exactly is the volume of the molten core material that could be expected during a severe accident involving the embodiment of the applicant's invention; b) what exactly is the expected highest temperature that the bottom of the pressure vessel would reach during this accident; c) what exactly is the required volume of water required to be present in the suppression pool to prevent core material melt-through of the pressure vessel; d) how soon after the accident must water be injected into the drywell, etc. Note also that this water for the drywell would be in addition to the water required to flood the core during a LOCA.

On page 26, 1st paragraph, the applicant discloses that since the volume of the lower part of the drywell is minimized, "it can be filled with water at a high speed, and moreover, by supplying the water rapidly, even greater efficiency can be obtained." The disclosure is insufficient as to what exactly is meant by filling water "at a high speed" and supplying water "rapidly", i.e., what exactly is the rate of water introduction?

On page 27, 3rd paragraph, the applicant discloses that in case of a transient, "it is possible to shut down the nuclear reactor at high-temperature in an isolated condition." The disclosure is insufficient as to what exactly is meant by "isolated condition."

On page 31, last sentence continuing to page 32, the applicant discloses a pressure containment vessel (402) having a double steel plate structure with fins (403).

The disclosure is insufficient as to what exactly is the size of the fins in relation, for example, with the thickness of the wall or the volume of the containment vessel.

On page 34, 1st paragraph, the applicant discloses that water is injected into the drywell 231 to cool the molten fuel and prevent damage to the lower portion of the pressure vessel. The disclosure is insufficient as to: a) what exactly is the volume of the molten core material that could be expected during a severe accident involving the embodiment of the applicant's invention; b) what exactly is the expected highest temperature that the bottom of the pressure vessel would reach during this accident; c) what exactly is the required volume of water required to be present in the suppression pool to prevent core material melt-through of the pressure vessel; d) how soon after the accident must water be injected into the drywell, etc.

On page 34, last paragraph, the applicant discloses thermal convection flow is created between the drywell 231 and pressure suppression pool 404 by having them connected at two points of different heights. There is neither an adequate description nor enabling disclosure as to how and in what manner to determine the locations of these two connections to so create the claimed thermal convection.

On page 36, 2nd full paragraph, the applicant discloses that in the event of a severe accident involving core meltdown, water from the pressure suppression pool flows by gravity through pipe 441, following the melt of metal seal 442, thereby cooling the molten core. There is neither an adequate description nor enabling disclosure as to how and in what manner said molten core cooling is so accomplished. Specifically, the disclosure is insufficient as to: a) what exactly is this low melting point metal seal; b)

when exactly is the seal broken, e.g., time after the accident or temperature necessary to melt the seal; c) how exactly would the pressure suppression pool be designed to ensure that back pressure from the steam/water mixture would not impede the flow of water by gravity; etc.

On page 36, 2nd full paragraph, the applicant discloses "abnormalities can be detected by differential pressure meter 443. The disclosure is insufficient as to what exactly are these "abnormalities" and, if they so occur and detected, how exactly does the applicant's invention correct such abnormalities.

There is neither an adequate description nor enabling disclosure as to how and in what manner the control rod drive mechanisms are provided inside the reactor core shroud (see claim 1). In fact, both the specification on page 20, lines 2+ and Fig. 1 disclose the control rod drive mechanisms being disposed on the shroud head but not inside the reactor core shroud.

There is neither an adequate description nor enabling disclosure of the parameters of a specific operative embodiment of the invention, including ratio of reactor power density to volume of suppression pool water, drywell to suppression pool volume ratio, ratio of the size pressure containment fins to either the thickness or volume of the pressure containment, specific locations of the two connections between the drywell and suppression pool to ensure creation of thermal convection flow, etc.

It is thus considered that the examiner (for the reasons given above) has set forth a reasonable and sufficient basis for challenging the adequacy of the disclosure. The statute requires the application itself to inform, not to direct others to find out for

themselves; *In re Gardner et al.*, 166 USPQ 138, *In re Scarborough*, 182 USPQ 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art, *In re Hirsch*, 131 USPQ 198.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-8 and 10-13 are rejected under 35 U.S.C. 101 because the claimed invention as disclosed is inoperative and therefore lacks utility.

The reasons the invention as disclosed is inoperative are the same as the reasons set forth in section 3 above as to why the disclosure is objected to, and said reasons are incorporated herein.

Claim Rejections - 35 USC § 112

5. Claims 1-8 and 10-13 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification in section 3 above.

6. Claims 4, 5, 7 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation, "a valve which can be optionally opened to an exterior of said reactor core shroud." The term "optionally" is ambiguous because it is can have different interpretations, e.g., is it "optional" based on the judgment of a reactor operator or is it "optional" depending on the operational conditions. See MPEP 2173.05(h)III.

Claim 5 recites the limitation "the spaces" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "the space regions" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the outer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1 – 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tominaga et al. (U.S. 5,087,408) in view of either one of Morishita et al. (JP 59-99393) or Forsberg (Nuclear Technology, Vol. 76, Jan. 1987), and further in view of Fortescue et al. (U.S. 3,475,272). Tominaga et al. disclose the applicant's claims except for top-entry controls rods and control rod drives within the reactor shroud.

Tominaga et al. disclose (e.g. see Fig. 5 or Fig. 15) a boiling water reactor with a passive containment system comprising a reactor core with fuel assemblies and shroud, reactor pressure vessel, control rods and control rod drives, reactor building and a pressure containment vessel. They disclose a drywell (4) and pressure suppression pool (6) within the pressure containment vessel (1), wherein said pressure suppression pool is positioned higher than said rector core, said pressure suppression pool being connected to said nuclear reactor vessel by means of a gravity-based piping through which water drops by gravity (e.g. see Fig. 15 and column 22, lines 5+).

As to the limitation in claim 3, the claim language reads on Tominaga et al.'s invention that disclose a piping and nozzles connected to the pressure vessel at positions above the core (e.g., see Figs. 5 or Fig 15).

As to the limitation in claim 4, the claim language reads on any one of the valves shown in either Fig. 5 or Fig. 15. Note that any one of these valves can be optionally opened to an exterior of the core shroud and is located above the fuel assembly.

As to the limitation in claim 6, Tominaga et al. disclose that the drywell and (4) and pressure suppression (6) communicate with each other by a plurality of vent pipes (8) formed in the vent wall (7) (e.g. see column 10, lines 40+). Note that the vent wall (7) has a plurality of openings at different elevations.

Morishita et al. disclose in Figs. 1–6 a boiling water reactor with control rods (113) that are inserted from the top of a nuclear pressure vessel (101). They teach that this configuration is more reliable than bottom-entry control rods that need to be inserted against gravity (see pages 3 and 4 of the English language translation).

Forsberg discloses in Fig. 1 the use of top-entry control rods for BWRs with passive emergency cooling systems (PECOS). He discloses that this configuration avoids bottom penetrations in the reactor vessel and therefore eliminates the possibility of pipe breaks and subsequent loss of ECCS water (e.g., seepage 185, last paragraph).

Either one of Morishita et al. or Forsberg disclose the control rod drive mechanism as being outside the reactor pressure vessel.

Fortescue et al. disclose a reactor (see Fig. 1) wherein the control rod drive mechanism (82) is contained within the pressure vessel. They teach that this arrangement allows easy replacement of the control rod drive mechanism with the reactor in the loading condition (see column 8 lines 56+).

One having ordinary skill in the art would have recognized that having top-entry control rods are advantageous over bottom-entry control rods. He would have also recognized that placing the control rod guide mechanism within the reactor pressure vessel is a well-known alternative to locating it outside the pressure vessel.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Tominaga et al., by the teachings of either one of the Morishita et al.- Fortescue et al. combination or Forsberg - Fortescue et al. combination, in order to have a boiling water reactor nuclear plant comprising: a reactor building; pressure containment vessel positioned in said building; drywell comprising a space inside said pressure containment vessel; pressure suppression pool provided inside said pressure containment vessel; reactor core having fuel assemblies supported by a reactor core support plate and an upper grid plate provided in an inner base portion of said nuclear reactor pressure vessel; reactor core shroud surrounding said reactor core and said upper grid plate; control rods inserted in said control rod guide tubes; and control rod drive mechanisms which drive the insertion and withdrawal of said control rods from above said reactor core, the control rod drive mechanisms being provided above said control rod guide tubes and inside said reactor core shroud, to gain the advantages thereof , because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one method of placement of the control rod drive mechanism by another well-known method of placement of this mechanism.

8. Claims 1 – 4, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamogawa (JP 2-115793) in view of Morishita et al. and further in view of Fortescue et al. Kamogawa discloses the applicant's claims except for some details on the boiling water reactor, top-entry controls rods and control rod drives within the reactor shroud.

Kamogawa discloses a reactor containment system having emergency reactor cooling water for injection of cooling water using gravity (see Figs. 1-10). In Fig. 10 he shows a reactor containment (1) consisting of a drywell (3) with a reactor pressure vessel (2) and suppression chamber (4). The bottom (7) of the suppression chamber (4) is located at a position higher that the reactor core (8). The suppression chamber and the reactor pressure vessel are connected via a valve (9) by a reactor core cooling piping (10).

As to the limitations in claims 3 and 4 , the claim language reads on said valve (9) and piping (10).

As to the limitation in claim 8, Kamogawa discloses in Fig. 5 a vacuum rupture valve (37) connecting the suppression chamber and the drywell.

Morishita et al disclose in Fig. 1-9 a boiling water reactor comprising a reactor core with fuel assemblies and shroud, reactor pressure vessel, control rods and control rod drives. The control rods (113) that are inserted from the top of a nuclear pressure vessel (101). They teach that this configuration is more reliable than bottom-entry control rods that need to be inserted against gravity (see pages 3 and 4 of the English

language translation). The control rod drive mechanism is outside the reactor pressure vessel.

Fortescue et al. disclose a reactor (see Fig. 1) wherein the control rod drive mechanism (82) is contained within the pressure vessel.

One having ordinary skill in the art would have recognized that the reactor containment of Kamogawa can be used for a water-cooled reactor, such as the boiling water reactor disclosed by Morishita et al. He would have also recognized that having top-entry control rods are advantageous over bottom-entry control rods. He would have further recognized that placing the control rod guide mechanism within the reactor pressure vessel is a well-known alternative to locating it outside the pressure vessel.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus, as disclosed by Kamogawa by the teachings of the Morishita et al.- Fortescue et al. combination, in order to have a boiling water reactor nuclear plant comprising: a reactor building; pressure containment vessel positioned in said building; drywell comprising a space inside said pressure containment vessel; pressure suppression pool provided inside said pressure containment vessel; reactor core having fuel assemblies supported by a reactor core support plate and an upper grid plate provided in an inner base portion of said nuclear reactor pressure vessel; reactor core shroud surrounding said reactor core and said upper grid plate; control rods inserted in said control rod guide tubes; and control rod drive mechanisms which drive the insertion and withdrawal of said control rods from above said reactor core, the control rod drive mechanisms being provided above said

control rod guide tubes and inside said reactor core shroud, to gain the advantages thereof , because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one method of placement of the control rod drive mechanism by another well-known method of placement of this mechanism.

8. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tominaga et al. in view of either one of Morishita et al. - Fortescue et al. combination or Forsberg - Fortescue et al. combination, as applied to claims 1-4 and 6 above, and further in view of Wedellsborg et al. (U.S. 5,087, 409). Either one of the Tominaga et al.- Morishita et al. - Fortescue combination or Tominaga et al.- Forsberg - Fortescue et al. combination disclose the applicant's claims except for the multi-plate construction of the pressure containment vessel.

Either one of the Tominaga et al.- Morishita et al. - Fortescue combination or Tominaga et al.- Forsberg - Fortescue et al. combination disclose a single pressure containment with ribs (e.g. see Fig. 1 in Tominaga et al.). Wedellsborg et al. teach a multishell vessel that can tolerate large differences in temperatures across its walls.

One having ordinary skill in the art would have recognized that the pressure vessel of Wedellsborg et al. and the pressure containment of either one of the Tominaga et al.- Morishita et al. - Fortescue combination or Tominaga et al.- Forsberg - Fortescue et al. combination, can both be made of the same material and serve the same pressure-retaining function.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of Tominaga et al.- Morishita et al. - Fortescue combination or Tominaga et al.- Forsberg - Fortescue et al. combination, by the teaching of Wedellsborg et al., to have a pressure containment vessel made of multiple steel plates having ribs, the multiple plates being mutually opposing in a separated fashion through he ribs, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one configuration of a pressure –retaining structure by another well-known configuration.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Tominaga et al.- Morishita et al. - Fortescue et al. - Wedellsborg et al. combination or the Tominaga et al.- Forsberg - Fortescue et al. - Wedellsborg et al. combination, as applied to claims 5 and 7 above, and further in view of Jeter (U.S. 4,644,780). Either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. combination or Tominaga et al.- Forsberg - Fortescue et al.- Wedellsborg et al combination disclose the applicant's claims except for the use of a guard pipes.

Jeter teaches that the Nuclear Regulatory Commission (NRC) has decreed that rupture conditions must be postulated on safety grade piping components and structural means must be provided to protect them from these conditions. He teaches the use of a guard pipe as a self-supporting pipe rupture and whip restraint system (see Abstract).

One having ordinary skill in the art would have recognized that the pipes and valves in a containment system, including the pressure vessel, suppression pool and drywell are safety grade piping.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al combination by the teaching of Jeter, in order to have a guard pipe extending from the dry well to the suppression pool, said pipe accommodating the valves and piping from the pressure vessel, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Tominaga et al.- Morishita et al. - Fortescue et al. - Wedellsborg et al.-Jeter combination or the Tominaga et al.- Forsberg - Fortescue et al. - Wedellsborg et al. – Jeter combination, as applied to claim 10 above, and further in view of Bunge et al. (DE-2144445). Either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter combination disclose the applicant's claim except for having the turbine installed in the reactor building.

Bunge et al. teach a reactor and turbine plant enclosed by the main reactor building. One having ordinary skill in the art would have recognized the arranged of

Bunge as an alternative way of configuring the reactor and turbine of a nuclear power plant by co-locating them in the same building.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter combination, by the teaching of Bunge et al., in order to have a turbine system installed on an upper portion of the reactor building, because such modification is no more than the use of conventional designs/techniques within the nuclear art, and the substitution of one way of configuring the reactor-turbine combination with another well-known configuration.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Tominaga et al.- Morishita et al. - Fortescue et al. - Wedellsborg et al.-Jeter-Bunge et al. combination or the Tominaga et al.- Forsberg - Fortescue et al. - Wedellsborg et al. –Jeter-Bunge et al. combination, as applied to claim 11 above, and further in view of Solorzano et al. (U.S.5,610,962). Either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter-Bunge combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter-Bunge combination disclose the applicant's claim except for the anti-seismic foundation base for the reactor building.

Solorzano et al. disclose a nuclear power plant construction method wherein the major structures including the reactor building are located on a common mat foundation that houses seismic isolators (see Abstract).

One having ordinary skill in the art would have recognized that Solorzano et al.'s method would be applicable to a boiling water reactor and that it has the advantage of providing protection of safety systems against seismic events.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter- Bunge combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter-Bunge combination, by the teaching of Solorzano et al. to have the reactor building positioned on a foundation base having an anti-seismic structure, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Tominaga et al.- Morishita et al. - Fortescue et al. - Wedellsborg et al.-Jeter-Bunge et al.- Solorzano et al. combination or the Tominaga et al.- Forsberg - Fortescue et al. - Wedellsborg et al. –Jeter-Bunge et al.- Solorzano et al. combination, as applied to claim 13 above, and further in view of either one of Takahiro (JP 2000-346993) or Masataka (JP11-311693). Either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter-Bunge- Solorzano et al. combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter-Bunge- Solorzano et al. combination disclose the applicant's claim except for the pressure vessel extraction from the reactor building.

Either one of Takahiro or Masataka discloses a method of extracting a reactor pressure vessel from the reactor building by providing an aperture in the roof of said building. Masataka teaches that exchanging the pressure vessel has the advantage of prolonging the life of a nuclear power plant.

One having ordinary skill in the art would have recognized that the method of either one of Takahiro or Masataka would be applicable and advantageous to a boiling water reactor, such as the power reactor of Tominaga et al.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify either one of the Tominaga et al.- Morishita et al. - Fortescue - Wedellsborg et al. –Jeter-Bunge- Solorzano et al. combination or Tominaga et al.- Forsberg - Fortescue et al.-Wedellsborg et al –Jeter-Bunge- Solorzano et al combination by the teaching of either one of Takahiro or Masataka, to provide an extraction space I the reactor building for lifting the reactor pressure vessel, to gain the advantages thereof, because such modification is no more than the use of conventional designs/techniques within the nuclear art.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference F further illustrates prior art.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP
July 21, 2002

MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER